

through chemical linkages between their surface-exposed collagen, provided, that where substantially all of the bone-derived elements are substantially completely demineralized bone-derived elements the osteoimplant contains at least one additional component selected from the group consisting of reinforcing particles and fillers.

2. (Amended) The osteoimplant of Claim 1 wherein substantially all of the bone-derived elements are superficially demineralized particles, strips or sheets of allogenic, xenogenic cortical or cancellous bone.

a/ 3. (Amended) The osteoimplant of Claim 1 wherein substantially all of the bone-derived elements are substantially completely demineralized particles, strips or sheets of allogenic, xenogenic cortical or cancellous bone, the reinforcing particles being selected from the group consisting of fully mineralized bone, graphite and pyrolytic carbon.

4. (Amended) The osteoimplant of Claim 1 wherein substantially all of the bone-derived elements are substantially completely demineralized particles, strips or sheets of allogenic, xenogenic cortical or cancellous bone, the filler being selected from the group consisting of hydroxyapatite, tricalcium phosphate, other calcium salts, bioglass, bioceramic, bioabsorbable polymer, nonbioabsorbable material and mixtures thereof.

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5. (Amended) The osteoimplant of Claim 1 containing an additional component selected from the group consisting of bone-growth inducing substance, growth factors, cellular material, genetic material, calcification-controlling agent and hydration agent.

10. (Amended) The osteoimplant of Claim 9 wherein the hydration-facilitating agent is glycerol.

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11. (Amended) The osteoimplant of Claim 1 wherein the chemical linkages are formed by exposing the bone-derived elements to a chemical crosslinking agent.

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19. (Amended) The osteoimplant of Claim 11 wherein substantially all of the bone-derived elements are superficially demineralized particles, strips or sheets or allogenic, xenogenic cortical or cancellous bone.

20. (Amended) The osteoimplant of Claim 11 wherein substantially all of the bone-derived elements are substantially completely demineralized particles, strips or sheets of allogenic, xenogenic cortical or cancellous bone, the reinforcing particles being selected from the group consisting of fully mineralized bone, graphite and pyrolytic carbon.

21. (Amended) The osteoimplant of Claim 11 containing an additional component selected from the group consisting of bone-growth inducing substances,

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growth factors, adhesives, plasticizers, flexibilizing agents, cellular material, genetic material, calcification-controlling agents, hydration facilitating agents, biostatic agents, biocidal agents, polymers, inorganic compounds, substances imparting radiopacity and metallic meshes.

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24. (Amended) The osteoimplant of Claim 11 wherein the bone-derived elements are superficially demineralized or substantially fully demineralized sheets obtained by longitudinally slicing the diaphyseal region of whole cortical bone.

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33. (Amended) The osteoimplant of Claim 24 configured and dimensioned as an intervertebral insert, a long bone, a cranial bone, a bone of the pelvis, a bone of the hand, a bone of the foot or section of any of the foregoing.

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35. (Amended) The osteoimplant of Claim 34 having incorporated therein one or more bone growth inducing or bone healing substances.

36. (Amended) The osteoimplant of Claim 1 wherein the chemical linkages are formed by application of energy.

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41. (Amended) The osteoimplant of Claim 36 wherein substantially all of the bone-derived elements are superficially demineralized particles, strips or sheets of allogenic, xenogenic cortical or cancellous bone.

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42. (Amended) The osteoimplant of Claim 36 wherein substantially all of the bone-derived elements are substantially completely demineralized particles, strips or sheets of allogenic, xenogenic cortical or cancellous bone, the reinforcing particles being selected from the group consisting of fully mineralized bone, graphite and pyrolytic carbon.

43. (Amended) The osteoimplant of Claim 36 containing an additional component selected from the group consisting of bone-growth inducing substances, growth factors, adhesives, plasticizers, flexibilizing agents, cellular material, genetic material, calcification-controlling agents, hydration facilitating agents, biostatic agents, biocidal agents, polymers, inorganic compounds, substances imparting radiopacity and metallic meshes.

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55. (Amended) The osteoimplant of Claim 46 configured and dimensioned as an intervertebral insert, a long bone, a cranial bone, a bone of the pelvis, a bone of the hand, a bone of the foot or section of any of the foregoing.

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58. (Amended) The osteoimplant of Claim 1 wherein the chemical linkages are formed by dehydrothermal treatment.

59. (Amended) The osteoimplant of Claim 58 wherein substantially all of the bone-derived elements are superficially demineralized particles, strips or sheets of allogenic, xenogenic cortical or cancellous bone.

60. (Amended) The osteoimplant of Claim 58 wherein substantially all of the bone-derived elements are substantially completely demineralized particles, strips or sheets of allogenic, xenogenic cortical or cancellous bone, the reinforcing particles being selected from the group consisting of fully mineralized bone, graphite and pyrolytic carbon.

61. (Amended) The osteoimplant of Claim 58 containing an additional component selected from the group consisting of bone-growth inducing substances, growth factors, adhesives, plasticizers, flexibilizing agents, cellular material, genetic material, calcification-controlling agents, hydration facilitating agents, biostatic agents, biocidal agents, polymers, inorganic compounds, substances imparting radiopacity and metallic meshes.

73. (Amended) The osteoimplant of Claim 64 configured and dimensioned as an intervertebral insert, a long bone, a cranial bone, a bone of the pelvis, a bone of the hand, a bone of the foot or section of any of the foregoing.

76. (Amended) The osteoimplant of Claim 1 wherein the chemical linkages are formed by enzymatic treatment.

78. (Amended) The osteoimplant of Claim 76 wherein substantially all of the bone-derived elements are superficially demineralized particles, strips or sheets of allogenic, xenogenic cortical or cancellous bone.

79. (Amended) The osteoimplant of Claim 76 wherein substantially all of the bone-derived elements are substantially completely demineralized particles, strips or sheets of allogenic, xenogenic cortical or cancellous bone, the reinforcing particles being selected from the group consisting of fully mineralized bone, graphite and pyrolytic carbon.

Q12 80. (Amended) The osteoimplant of Claim 76 containing an additional component selected from the group consisting of bone-growth inducing substances, growth factors, adhesives, plasticizers, flexibilizing agents, cellular material, genetic material, calcification-controlling agents, hydration facilitating agents, biostatic agents, biocidal agents, polymers, inorganic compounds, substances imparting radiopacity and metallic meshes.

Q13 92. (Amended) The osteoimplant of Claim 83 configured and dimensioned as an intervertebral insert, a long bone, a cranial bone, a bone of the pelvis, a bone of the hand, a bone of the foot or section of any of the foregoing.

Reconsideration and allowance of Claims 1-94 are respectfully requested in light of the remarks which follow.

REMARKS

The Examiner has rejected Claims 1-94 for obviousness-type double patenting over Claims 1-72 of commonly assigned Boyce et al. U.S. Patent No. 6,123,731 ("Boyce et al."). By way of obviating this rejection, applicants submit herewith a